

[0023] FIG. 9 is an explanatory view of a second input operation state in the embodiment of an inputting method of the present invention;

[0024] FIG. 10 is an external view of the main part of a second embodiment of an input device to which an inputting method of the present invention is applied; and

[0025] FIG. 11 is a functional block diagram of the input device of FIG. 10.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0026] The preferred embodiments of the present invention will now be described with reference to the drawings.

[0027] FIGS. 1 to 5 show a first embodiment of the present invention. FIG. 1 is a schematic perspective view showing an input device. FIG. 2 is a schematic enlarged exploded perspective view of the main part of an input unit. FIG. 3 is a schematic enlarged vertical sectional view of the main part of the input unit. FIG. 4 is an explanatory view showing the ON operation state of a second input switch. FIG. 5 is a functional block diagram of the input device.

[0028] As shown in FIG. 1, the input device 1 of the present invention has a display unit 2 and an input unit 3. The display unit 2 and the input unit 3 are accommodated in a case 4. The case 4 has a predetermined shape in accordance with the intended use such as a main body case for a mobile phone.

[0029] The display unit 2 is for displaying at least input data obtained from an input operation. As the display unit 2, a display panel 5 is used. The display panel 5 has a display portion (display region) 5a that displays data. The input data for a key 12a of a key sheet 12 (to be hereinafter described) of the input unit 3 can be displayed at a corresponding position in the display portion 5a.

[0030] The display panel 5 is selected from known panels such as a liquid crystal display panel and an organic electroluminescent display panel according to needs such as design concept.

[0031] The display by the display unit 2 is selected from monochrome display, multicolor display, and full color display according to needs such as device specification and design concept.

[0032] The display portion 5a of the display panel 5 is selected according to needs such as design concept from the following: a display portion 5a capable of being switched between a provisional display mode and a final display mode; a display portion 5a including a provisional display region and a final display region; and a display portion 5a displaying the same graphics as the input unit 3, a portion of the graphics corresponding to the provisionally input data being highlighted.

[0033] The input unit 3 is for inputting data. As shown in FIGS. 2 and 3, the input unit 3 has a first input sensor 6 and second input switches 7. The first input sensor 6 functions as a first input unit for the first input operation. The second input switches 7 function as second input units for the second input operation confirming the input.

[0034] As the first input sensor 6, a flat sensor including a capacitance sensor or a pressure sensor and capable of coordinate input is used.

[0035] An example of a capacitance sensor is described in Japanese Unexamined Patent Application Publication No. 2001-344064 herein incorporated by reference. X-direction sensing electrodes and Y-direction sensing electrodes which are made of Ag (silver) base paste are arranged in a matrix form in opposed relation to each other, with a resin sheet sandwiched therebetween. The resin sheet is made of polyethylene terephthalate (PET) and the like, and has insulation properties and a predetermined dielectric constant. The resin sheet is disposed on a board with a conductive pattern. The electrodes are connected to the conductive pattern. A touch of a dielectric material such as a finger on the surface of the sensor causes a change of capacitance between the X-direction sensing electrodes and the Y-direction sensing electrodes at the touch position, enabling input from the X-Y coordinate.

[0036] The pressure sensor includes, for example, a resistor to which a potential difference is applied in X and Y directions, and a conductive member facing the resistor. Pressing the surface of the sensor brings the conductive member into contact with the resistor and enables coordinate input because of a change of resistance values.

[0037] In this embodiment, twelve second input switches 7 are provided. The second input switches 7 are disposed behind the first input sensor 6. When an operator presses the surface of the first input sensor 6 with a finger, one of the switches 7 performs switching by the pressure force.

[0038] The twelve switches 7 are arranged in a matrix with four columns and three rows. Each switch has a fixed electrode 8 and a movable electrode 9. The twelve pairs of fixed electrodes 8 and movable electrodes 9 are capable of coming into contact with each other separately.

[0039] The fixed electrodes 8 are circular and disposed on a printed circuit board 10 disposed behind the first input sensor 6 (FIG. 3). On the circuit board 10, movable electrode terminals 9a are also provided. The terminals 9a are rings surrounding the fixed electrodes 8. The fixed electrodes 8 and the movable electrode terminals 9a are connected electrically to a predetermined conductive pattern (not shown) on the printed circuit board 10, in a known manner.

[0040] The movable electrodes 9 are disposed so as to face the fixed electrodes 8 and connected electrically to the movable electrode terminals 9a on the printed circuit board 10 (FIG. 3).

[0041] The shape of the fixed electrodes 8, the movable electrodes 9, and the movable electrode terminals 9a may be selected from known shapes according to needs such as design concept.

[0042] Behind the first input sensor 6, a stem sheet 11 (a sheet having projections) made of insulating resin is disposed. As shown in FIG. 4, when the first input sensor 6 is pressed with a finger and the like, a projection of the stem sheet 11 makes a movable electrode 9 come into contact with the corresponding fixed electrode 8.

[0043] The number of the second input switches 7 may be determined according to needs such as design concept.

[0044] As shown in FIGS. 2 and 3, the surface of the first input sensor 6 is covered with a key sheet 12. The key sheet 12 is made of resin such as PET or silicon rubber. A plurality